

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 020057PC2	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/SE03/00556	International filing date (<i>day/month/year</i>) 04.04.2003	Priority date (<i>day/month/year</i>) 05.04.2002
International Patent Classification (IPC) or national classification and IPC ₇ C04B 35/58, C22C 29/18, H05B 3/14		
Applicant SANDVIK AB et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 07.08.2003	Date of completion of this report 05.11.2003
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. 08-667 72 88	Authorized officer Ulrika Nilsson/MP Telephone No. 08-782 25 00

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE03/00556

I Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
 pages 1-6, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☒ the claims:
 pages _____, as originally filed
 pages _____, as amended (together with any statement) under article 19
 pages _____, filed with the demand
 pages 1-2, filed with the letter of 24.10.2003
- ☐ the drawings:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
 pages _____, as originally filed
 pages _____, filed with the demand
 pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item. These elements were available or furnished to this Authority in the following language English which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☒ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheet/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2 (c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item I and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/SE03/00556

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-7</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-7</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-7</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

This statement is based on the claims 1-7 filed with the letter of October 24, 2003.

The following documents are cited in the International Search Report:

DE 179 100 A (METALLWERK PLANSEE GESELLSCHAFT M.B.H.)
US 3 269 806 A (ERICH FITZER ET AL)
GB 899 464 A (AKTIEBOLAGET KANTHAL)

The documents cited in the International Search Report are considered to represent the general state of the art.

The invention defined in amended claims 1-7 is not disclosed by these documents.

The cited documents do not give any indication that would lead a person skilled in the art to the claimed method. Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in amended claims 1-7 is novel and is considered to involve an inventive step. The invention is also industrially applicable.

CLAIMS

1. A method of producing a heating element that is comprised essentially of molybdenum silicide and alloys of this basic
5 material, which forms aluminium oxide on its surface, c h a r a c t e r i s e d by producing a material that contains substantially $\text{Mo}(\text{Si}_{1-x}\text{Al}_x)_2$ and Al_2O_3 by mixing a mixture of a silicon and molybdenum compound with an aluminium compound; in that the silicon and molybdenum compound either include
10 $\text{Mo}(\text{Si}_{1-y}\text{Al}_y)_2$ and are mixed with either an aluminium compound consisting of Al_2O_3 or $\text{Al}(\text{OH})_3$ and possibly mixed with one or more of the compounds SiO_2 , Si and MoO_3 or by virtue of the mixture of the silicon and molybdenum compound containing MoO_3 and Al and Si and/or SiO_2 ; in that the input components
15 together have a degree of purity corresponding to at least 98%; and in that the mixture is caused to react exothermically and/or by being sintered so that exchange reactions are caused to take place, to form the compounds $\text{Mo}(\text{Si}_{1-x}\text{Al}_x)_2$ and Al_2O_3 , where x is caused to lie in the range of 0.4 - 0.6.

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2. A method according to Claim 1, c h a r a c t e r i s e d in that said SiO_2 is included in silicates, such as mullite and sillimanite, which do not effect the symmetry of the crystal lattice of molybdenum silicide.

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3. A method according to Claim 1 or 2, c h a r a c t e r i s e d in that x is caused to lie in the range of 0.45 - 0.55.

4. A method according to Claim 1 2 or 3, c h a r a c t e r i s e d by adding one or more of the following sintering
30 auxiliaries MgO , CaO , SiO_2 and Y_2O_3 to said mixture.

5. A method according to Claim 1 2, 3 or 4, c h a r a c t -

e r i s e d by substituting molybdenum partly with Re or W
or Nb in the material $\text{Mo}(\text{Si}_{1-x}\text{Al}_x)_2$.

6. A method according to Claim 5, c h a r a c t e r i s e d
5 by replacing molybdenum with W in an amount corresponding to
approximately one third.

7. A method according to any one of the preceding Claims,
c h a r a c t e r i s e d in that the input components have a
10 degree of purity of at least 99%.